Center Innovation Fund: MSFC CIF

Ionic Polyimides: New High Performance Polymers for Additive Manufacturing - FY17

Completed Technology Project (2016 - 2017)

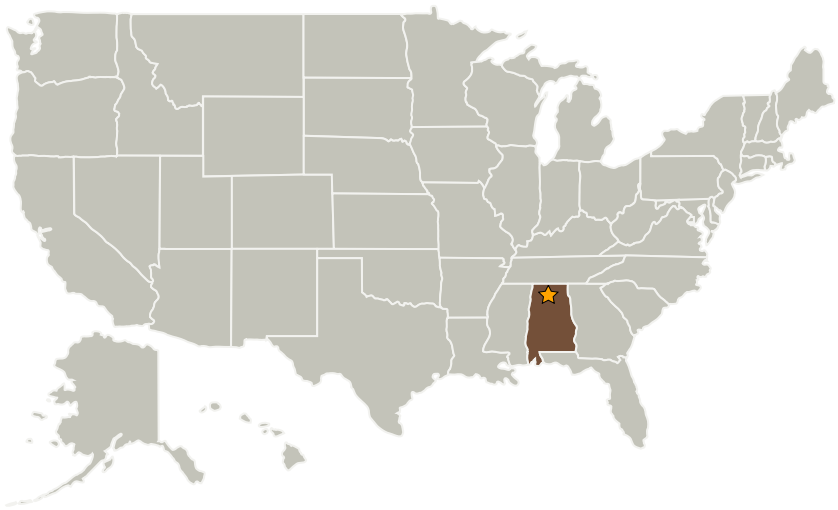
Project Introduction

Deliverables are a set of structure-property relationships (e.g. Tg/Tm relative to different ionic polyimide structures). This will provide an initial understanding of the first generation of materials which can then be used for proof-of-concept additive manufacturing as well as to guide the development of further materials.

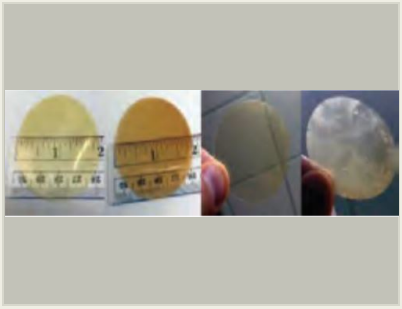
Anticipated Benefits

The goal of this proposal is to understand the structure-property-performance relationships underlying ionic polyimides and understand their utility as materials suitable for additive manufacturing of components of aerospace vehicles, with an emphasis on characterizing their thermal behaviors and properties to in-turn develop novel pellets that can lead to the development of filament feedstock for 3D printing.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
The University of Alabama	Supporting Organization	Academia	Tuscaloosa, Alabama



Photographs of the first-generation ionic polyimide films

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Primary U.S. Work Locations

Alabama

Images

Project Image
Photographs of the first-generation ionic polyimide films
(https://techport.nasa.gov/image/35796)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Center Innovation Fund: MSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

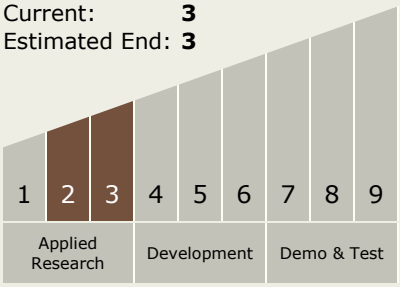
John W Dankanich

Principal Investigator:

Enrique M Jackson

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Completed Technology Project (2016 - 2017)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.1 Lightweight Structural Materials

Target Destinations

Earth, Foundational Knowledge